

United States Patent [19]
Smutek et al.

[11] Patent Number: **4,553,206**
[45] Date of Patent: **Nov. 12, 1985**

[54] **IMAGE STORAGE AND RETRIEVAL**

[75] Inventors: John M. Smutek, Billerica; Robert I. Wenig, Lowell, both of Mass.; Nancy J. Webb, Derry; Amnon Waisman, Nashua, both of N.H.

[73] Assignee: Wang Laboratories, Inc., Lowell, Mass.

[21] Appl. No.: 538,682

[22] Filed: Oct. 3, 1983

[51] Int. Cl.⁴ G06F 15/40

[52] U.S. Cl. 364/300

[58] Field of Search 364/200, 300, 900 MS File

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,352,165 9/1982 Hevenor, Jr. 364/900.
4,419,740 12/1983 Hevenor, Jr. 364/900.

Primary Examiner—Raulfe B. Zache

Attorney, Agent, or Firm—Michael H. Shanahan

[57] **ABSTRACT**

An improved technique is presented for organizing digitized information for storage in a relational type tree memory structure where the digitized information is

broken up into blocks of a fixed byte size which are then stored throughout the memory. A header is utilized which identifies a text or image and details of how the image was digitized and compressed, to be used in re-constructing the image properly. We also utilize an index in which is the image or text identity but also in which is an index identifying the locations throughout memory at which the blocks containing the text or image information is stored. Each block has a header identifying what text or image information is stored in the block and having the address of any another block containing related information for the same text or image to thereby create a chaining between the blocks by which they may all be quickly located once a first block is located using the index. A further embodiment of invention allows the storing and display of a base image containing user defined and located subfields and the selective insertion of related data or images, either previously stored or entered by the user, into the subfields. A yet further embodiment allows the use of data contained in the subfields as keys to locate and display further related information.

29 Claims, 9 Drawing Figures

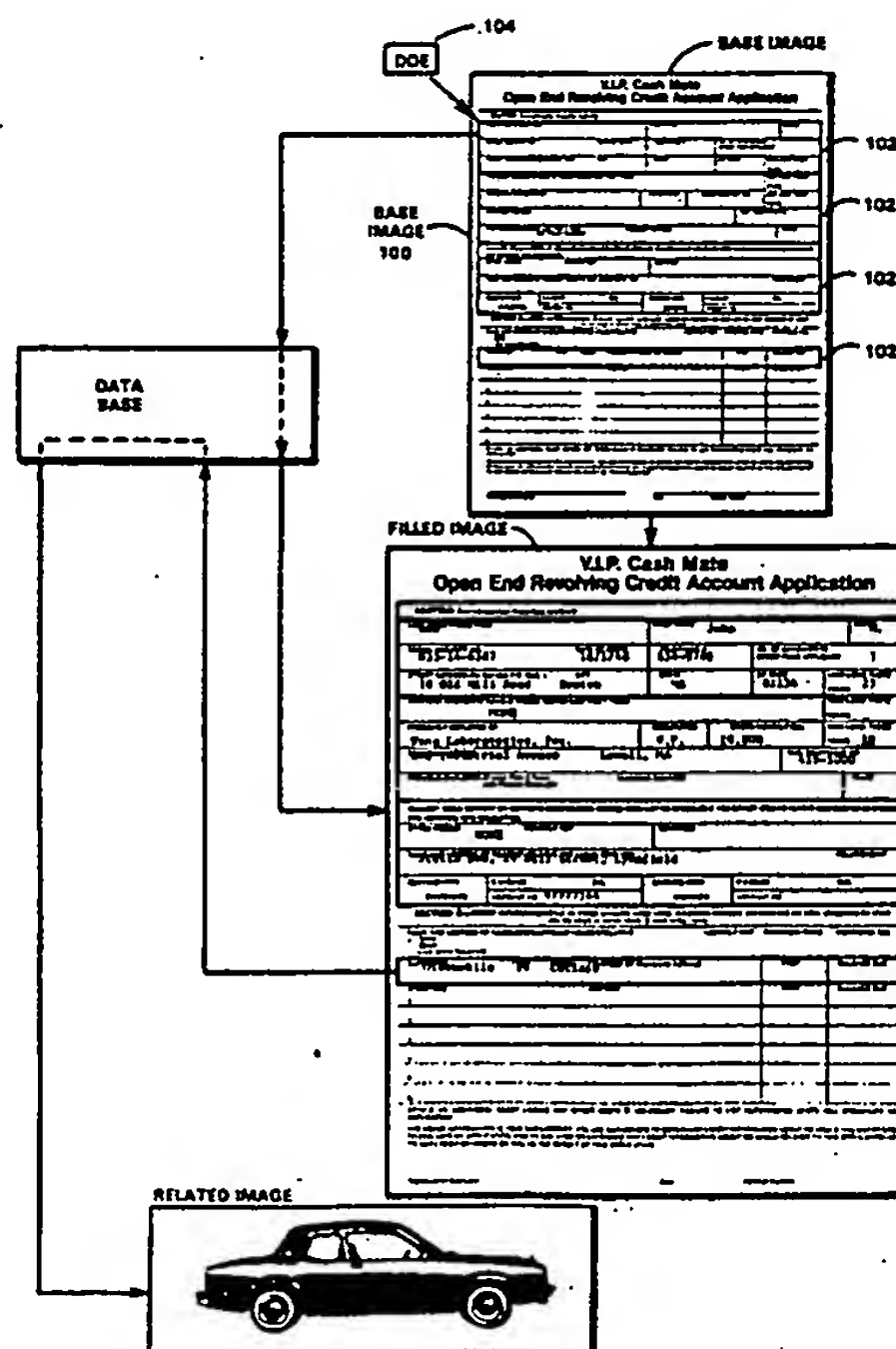


IMAGE STORAGE AND RETRIEVAL

FIELD OF THE INVENTION

This invention relates to video display terminals on which alphanumeric and graphic information are displayed and more particularly to video display terminals used in storing, retrieving and displaying information from data bases.

BACKGROUND OF THE INVENTION

In the prior art, systems having video display terminals have been utilized with other electronic equipment including mass or bulk memory in which information is stored in data bases and such information may be entered, retrieved and processed by an operator using a video display terminal. Such systems are widely used in many industries and businesses. One example of such use is in the insurance industry where insurance claim information is stored, processed to settle claims, analyzed to derive statistical and other business information, and to provide extremely rapid recall of previously stored information regarding claims or concerning an insurance holder. Another example of such use is in the medical profession. Medical and business records for private physicians and hospitals comprise much information such as patient personal information, history of treatment including hospitalization and medication, billing and payments, inventory of medical and other equipment and medicines, and information concerning medical personnel are easily updated and quickly retrievable to assist in diagnosis and treatment, billing, planning for medical equipment expenditures, equipment and plant maintenance, equipment replacement, plant expansion, and staffing, training, scheduling and replacement of medical and other personnel.

The extensive information required and generated by varied applications including those mentioned in the applications briefly described in the last paragraph are stored in large data bases that are typically made up of a number of smaller data bases. For example, in the medical field one data base is used to store medical histories, while another data base is used to store billing and payment information, yet another data base is used to store equipment inventory, maintenance and availability, and still another data base is used to store medical personnel information including work scheduling. The multiple data bases are not relationally tied together so that all information in different data bases regarding a single patient, doctor, or hospital information must be separately and laboriously retrieved.

Prior art uses of video terminals and associated equipment for the above described and many other applications are generally limited to the display of alphanumeric and sometimes graphical information. This excludes the display of much valuable information in the form of drawings, pictures and other image information which must be filed in hard form in file drawers or other filing facilities from which they must be manually retrieved and refiled. This is a time consuming approach which has improved very little over time.

Accordingly, there is a need in the prior art for equipment and techniques used with video terminals and associated equipment to quickly store and retrieve varied types of alphanumeric and graphical information in a relationally oriented data base. Such information may be represented in coded form, such as alphanumeric characters or graphic symbols represented by ASCII

and other codes, or raster patterns logically comprised of rows and columns of pixels or pells, such as representations of pictures.

SUMMARY OF THE INVENTION

In accordance with the teaching of our invention we provide an improved arrangement and technique utilizing a video terminal and related equipment whereby graphics and image information such as drawings, photographs and all other forms of images are created by raster scanning the document, or by filling a bit map memory by some software program. Such images may then be easily stored, retrieved, and edited and singly or compositely displayed, with the addition of text if desired. In addition, portions of an image or portions of different images or text may be selected, retrieved and displayed, or may be selected and displayed together in a "cut-and-paste" manner but on the screen of the video terminal. A highly flexible and novel "forms fill" operation is also possible.

The use of our invention opens up many new very practical business applications that have heretofore been impossible or impractical. For example, in a realtor's office environment the standard statistical and pricing information typically entered on cards may be entered in a system including a video display terminal and bulk memory. Using data base searching techniques, the stored information regarding houses for sale may be searched to select a list of houses of possible interest based on size, cost, or location of a house using information supplied by a potential buyer. The potential buyer will then review the results of such a search and will typically select a few of the houses in the search output list for closer review. The final result is one or more houses that the potential buyer actually wants to visit. To aid the potential buyer in selecting the house(s) to visit, and to minimize the number of visits, the use of our novel method and arrangement in such a realtors office setting permits one large relationally oriented data base to include digitized information representing not only such things as the statistical data, but also such things as house floor plans, property plot plans and photographs of the outside and inside of each house. After indicating a house of interest and operating one or two additional keys on a keyboard of the video terminal the potential buyer may display the photographs and plans for each house on the display of the video terminal. By this mode of operation prospective buyers receive much more information about a house of interest than heretofore possible, and are better able to decide if they want to visit the house.

Our present invention utilizes one dimensional compression to store images wherein each image line scanned and digitized is compressed by itself without any relationship to any other digitized scan lines. As described in the detailed description hereinafter, this enables the user of a system such shown in FIG. 1 and equipped with our invention to easily store images, and then later select portions of pictures to be used as is or to be combined with text material in a composite document.

Each image that is scanned, digitized and compressed for storage and subsequent retrieval in accordance with the teaching of our invention is identified by an image identity or token. In addition, each scanned, digitized and stored image has separately stored header and index information associated therewith which has information

[11] Patent Number: 5,767,661
[45] Date of Patent: Jun. 16, 1998

5,367,244	11/1994	Rose et al.	320/23
5,426,371	6/1995	Salley et al.	324/429
5,633,576	5/1997	Rose et al.	320/23

Primary Examiner—Adolf Berhane
Assistant Examiner—Gregory J. Teatley, Jr.
Attorney, Agent, or Firm—Georges A. Maxwell

[57] **ABSTRACT**

An emergency stop warning system for an automobile with a hydraulically operated brake system and that includes an electric power supply, a warning sound emitting electrically operated horn connected with the power supply, a normally open fluid pressure actuated switch electrically connected between the power supply and the horn and hydraulically connected with the brake system; that the hydraulically actuated switch is set to close and cause the horn to sound when fluid pressure in the braking system is increased to cause the automobile to decelerate and stop at a faster than normal rate.

18 Claims, 3 Drawing Sheets

[58] **Field of Search** 320/48, 36, 32,
320/30, 40, 150, 152, DIG. 10, DIG. 11,
DIG. 12, DIG. 13; 324/429, 431, 433; 429/61,
90; 340/636

U.S. PATENT DOCUMENTS

US-PAT-NO: 5767661

DOCUMENT-IDENTIFIER: US 5767661 A

****See image for Certificate of Correction****

TITLE: Battery charger

Brief Summary Text - BSTX (11):

The manufacturers of batteries, in order to gain and maintain desired shares of the marketplace, have given warranties that provide for the replacement of batteries that are reasonably determined to be defective or incapable of serving their intended purpose. Many of those warranties provide for discounts on the purchase price of new replacement batteries. Most of those warranties prorate the discounts for scheduled periods of time following the purchased date of the batteries to be replaced.

Motivation as to inquire ~~from~~ from
buyer if part is a replacement
part — to provide a discount if
under warranty